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L2 and (hyperlink$ or url or www or http or browser)	12

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L2	L1 and (electronic$4 or online or computer$6 or digital$4) same (graphic$4 or text$3) same (patient or user) same (folder$ or tree$ or icon$3)	41	L2
L1	(improv$6 or render$6 or remodel$3) same (radiolog$6 or ultrasound or mri or magnetic resonance image or x-ray$ or ct or computer tomography or nuclear medicine) same (imag$3 or display$3)	17723	L1

END OF SEARCH HISTORY

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Terms	Documents
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Database:
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DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ			
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L3	L2 and (hyperlink$ or url or www or http or browser)	12	L3
L2	L1 and (electronic$4 or online or computer$6 or digital$4) same (graphic$4 or text$3) same (patient or user) same (folder$ or tree$ or icon$3)	41	L2
L1	(improv$6 or render$6 or remodel$3) same (radiolog$6 or ultrasound or mri or magnetic resonance image or x-ray$ or ct or computer tomography or nuclear medicine) same (imag$3 or display$3)	17723	L1

END OF SEARCH HISTORY

Patent Assignment Abstract of Title

Total Assignments: 1

Application #: 09726475 **Filing Dt:** 11/30/2000 **Patent #:** NONE **Issue Dt:**

PCT #: NONE **Publication #:** US20020065684 **Pub Dt:** 05/30/2

Inventors: Perry L. Schwalb, Eric S. Schulze, Jonah H. Still

Title: Electronic method and system that improves efficiencies for rendering diagnosis of radiology procedures

Assignment: 1

Reel/Frame: 011651/0038 **Received:** 04/10/2001 **Recorded:** 11/30/2000 **Mailed:** 06/12/2001 **Page**

Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Assignors: SCHWALB, PERRY **Exec Dt:** 11/30/2000

SCHULZE, ERIC **Exec Dt:** 11/30/2000

STILL, JONAH **Exec Dt:** 11/30/2000

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☐ 1. Document ID: US 20030098893 A1

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L3: Entry 1 of 12 File: PGPB May 29, 2003

PGPUB-DOCUMENT-NUMBER: 20030098893
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030098893 A1

TITLE: Systems and methods for managing interaction with a presentation of a tree structure in a graphical user interface

PUBLICATION-DATE: May 29, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Makinen, Bruce A.	Fort Collins	CO	US	

US-CL-CURRENT: 345/853

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

☐ 2. Document ID: US 20020198764 A1

L3: Entry 2 of 12 File: PGPB Dec 26, 2002

PGPUB-DOCUMENT-NUMBER: 20020198764
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020198764 A1

TITLE: On-line evaluating and marketing system and method

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

☐ 3. Document ID: US 20020127525 A1

L3: Entry 3 of 12 File: PGPB Sep 12, 2002

PGPUB-DOCUMENT-NUMBER: 20020127525
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020127525 A1

TITLE: Distributive processing simulation method and system for training healthcare teams

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 4. Document ID: US 20020065684 A1

L3: Entry 4 of 12 File: PGPB May 30, 2002

PGPUB-DOCUMENT-NUMBER: 20020065684
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020065684 A1

TITLE: Electronic method and system that improves efficiencies for rendering diagnosis of radiology procedures

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 5. Document ID: US 20020063560 A1

L3: Entry 5 of 12 File: PGPB May 30, 2002

PGPUB-DOCUMENT-NUMBER: 20020063560
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020063560 A1

TITLE: MR imaging system with interactive MR geometry prescription control over a network

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 6. Document ID: US 20020010571 A1

L3: Entry 6 of 12 File: PGPB Jan 24, 2002

PGPUB-DOCUMENT-NUMBER: 20020010571
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020010571 A1

TITLE: Systems and methods for interactive virtual reality process control and simulation (IVRPCS)

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 7. Document ID: US 6739877 B2

L3: Entry 7 of 12 File: USPT May 25, 2004

US-PAT-NO: 6739877
DOCUMENT-IDENTIFIER: US 6739877 B2

TITLE: Distributive processing simulation method and system for training healthcare teams

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw De

☐ 8. Document ID: US 6640145 B2

L3: Entry 8 of 12 File: USPT Oct 28, 2003

US-PAT-NO: 6640145
DOCUMENT-IDENTIFIER: US 6640145 B2

TITLE: Media recording device with packet data interface

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw De

☐ 9. Document ID: US 6492812 B1

L3: Entry 9 of 12 File: USPT Dec 10, 2002

US-PAT-NO: 6492812
DOCUMENT-IDENTIFIER: US 6492812 B1

TITLE: MR imaging system with interactive MR geometry prescription control over a network

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw De

☐ 10. Document ID: US 6331776 B1

L3: Entry 10 of 12 File: USPT Dec 18, 2001

US-PAT-NO: 6331776
DOCUMENT-IDENTIFIER: US 6331776 B1
** See image for Certificate of Correction **

TITLE: MR imaging system with interactive MR geometry prescription control over a network

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw De

☐ 11. Document ID: US 6289299 B1

L3: Entry 11 of 12 File: USPT Sep 11, 2001

US-PAT-NO: 6289299
DOCUMENT-IDENTIFIER: US 6289299 B1

TITLE: Systems and methods for interactive virtual reality process control and simulation

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw De

☐ 12. Document ID: US 20020065684 A1

L3: Entry 12 of 12 File: DWPI May 30, 2002

DERWENT-ACC-NO: 2002-527194
DERWENT-WEEK: 200256

TITLE: Electronic efficiency improving method for radiologist, uses computer monitor to simulate radiology light box for displaying electronic radiology images, and digital graphical representation of patient's master folder

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw De

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Terms	Documents
L2 and (hyperlink$ or url or www or http or browser)	12

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Previous Page Next Page Go to Doc#

L5: Entry 46 of 50 File: USPT Dec 30, 2003

DOCUMENT-IDENTIFIER: US 6669482 B1
TITLE: Method for teaching interpretative skills in radiology with standardized terminology

Abstract Text (1):
A training method for improving diagnostic accuracy and reducing variability in the interpretation of radiologic exams. Exam images, whether presented on radiographic film, on photographic paper, or on a computer monitor, are interpreted using standardized feature descriptors, such as in BI-RADS. The exam interpreter uses the feature descriptors to characterize findings in exam images and provides an assessment and conclusion concerning the presence of biologic processes that would have caused the image finding. Evidence for the presence or absence of these biologic processes is obtained. Measures of diagnostic accuracy are calculated from these data and all this information is tracked and associated with the exams. Subsequent to image interpretation, exam findings and tracked data are reviewed in a case-based manner to teach the image interpreter to better understand the relationship between features and the biologic processes that they are associated with, thereby improving the interpreter's diagnostic accuracy and reducing variability in their characterization of image findings. Repetitive use of this method further improves diagnostic accuracy and reduces variability in the characterization of image findings.

Brief Summary Text (3):
The invention relates to a method for improving a radiologists or other interpreters skills in interpreting radiologic images whether film images viewed on a multiviewer or the like, or digital images viewed on a computer screen. The method includes use of standardized terminology during interpretation of radiologic studies to characterize image findings. The method tracks an interpreter's use of this terminology in addition to their assessments and conclusions concerning the presence or absence of biological processes that cause the image finds and tracks evidence for the presence or absence of these biological processes. The method further employs repetitive feedback to interpreters concerning their diagnostic accuracy and use of standardized feature descriptors to refine their understanding of the appropriate use of the terminology.

Brief Summary Text (5):
Variability in the interpretation of radiological exams is a known phenomenon, and has recently received considerable attention in the area of breast imaging. For example, recent research has demonstrated marked variability in radiologists' interpretation of mammograms (Elmore, 1995 & 1998; Beam, 1996). The authors of these studies have noted the need for efforts to improve accuracy and reduce variability in the interpretation of mammograms. Unlike analytic tests (e.g. serum electrolytes), the interpretation of radiologic tests involves a significant amount of subjective judgment. This phenomenon has been discussed in numerous publications (Elmore, 1995; Beam, 1996), and includes both (a) failures in detection (i.e., failure to identify an abnormality), and (b) failures of characterization (e.g., failure to properly classify an abnormality as benign or malignant once its features have been assessed). The method of the present invention addresses this second source of variability, focusing on a method for improving diagnostic accuracy and reducing the variability of an interpreters' characterization of

abnormalities seen on radiologic examinations.

Brief Summary Text (7):
Breast imaging is one of the first subspecialties of radiology to embrace standardized reporting. Standardized reporting uses defined terminology and report formats to improve consistency and reduce confusion in the reporting of image findings and abnormalities. Mammography is the first area of breast imaging in which widespread use of standardized reporting is becoming common practice. This results, in part, from Federal regulations which went into effect Apr. 28, 1999, requiring all mammographic facilities in the United States to use standardized assessment and recommendation terminology at the end of mammographic reports. The assessment and recommendation language is nearly identical to that used in the American College of Radiology's (ACR's) Breast Imaging and Reporting Data System (BI-RADS). BI-RADS was developed for standardized mammography reporting and was first released in 1993 (Kopans, 1993). The ACR's promotion of BI-RADS helped influence the Food and Drug Administration's (FDA's) requirement that standardized assessment and recommendation terminology appear at the end of mammographic reports. The promotion of BI-RADS has also prompted development of standardized terminology for other imaging modalities. For example, standardized reporting terminology for breast ultrasound is being pursued by several groups (ACR Bulletin 1999; Hawkins, 1998).

Brief Summary Text (9):
Standardized reporting formats include lexicons of feature descriptors used to categorize image findings and abnormalities (Kopans, 1993; D'Orsi, 1995 & 1998; Hawkins, 1998). In the case of BI-RADS, D'Orsi, et al (1993) have attempted to group BI-RADS lexicon features according to the probability of their association with malignancy. However, it is only recently that the association of BI-RADS features with benign and malignant breast disease has been empirically evaluated (Lieberman, 1998). New and/or altered descriptors that better discriminate between benign and malignant breast disease will be incorporated into BI-RADS as they are discovered. As these type of improvements are made in BI-RADS, proper use of the feature descriptors will help guide radiologists to more accurate characterization of mammographic findings. The same is anticipated for feature descriptors of other standardized reporting systems.

Brief Summary Text (13):
Practice audits in breast imaging have been used for a number of years to improve the skills of interpreters. Hence the Agency for Health Care Policy and Research (AHCPR) has strongly encouraged them (Basset, 1994), and the AHCPR audit recommendations became Federal Law in 1999 (Federal Register, 1998). Breast imaging facilities are now required to track mammography assessments and recommendations according to structured assessment and recommendation categories. This aides practice in calculating profiles such as true positive, true negative, false positive and false negative rates, as well as sensitivity, specificity and positive predictive values. Audits containing this information have been shown to be a powerful educational tool for refining radiologist's interpretive skills (Bird, 1992; Sickles, 1990; Spring, 1991; Linver 1992). However, this type of audit information only provides radiologists with a general overview of the strengths and weaknesses of their interpretive skills. For example, these audits enable radiologists to identify poor specificity in mammographic interpretations. They do not provide radiologists with mechanisms to examine the relationship between features of image findings and diagnostic decision making. The method of the current invention provides this type of mechanism, and like a practice audit, is a powerful educational tool.

Brief Summary Text (15):
The primary object of the present invention is a training method to improve the accuracy and reduce the variability of anyone who reads and interprets radiologic examinations. The method tracks the reader's (image interpreter's) diagnostic

accuracy and use of standardized feature descriptors during interpretation of radiologic examinations. The method is not only useful for training readers how to appropriately use descriptors of a standardized reporting system, but it also leads to a detailed understanding of the association of findings with specific types of pathology (e.g., benign and malignant disease). As described herein, the method utilizes repetitive feedback concerning an interpreter's diagnostic accuracy and use of standardized terminology during exam interpretation. It improves accuracy of interpretations and reduces variability in the use of standardized terminology.

Brief Summary Text (25):
In accordance with the invention, generally stated, a training method is described by which a radiologist's or other exam interpreter's ability to interpret radiologic studies of a patient, whether presented on film, or in a digital format is measured. Initially, the radiologist or image interpreter views and interprets a set of radiologic exams. For each viewed image in an examination, a finding is made and the radiologist or image interpreter describes the features of the finding using BI-RADS descriptors. An assessment of the presence of a malignancy is also provided. The results are then reviewed to assess both the accuracy of the diagnosis and the use of the descriptors. After this initial image interpretation, the radiologist or image interpreter reviews their diagnostic accuracy and use of feature descriptors, in addition to patient outcomes. Subsequent image interpretation and case review aids the radiologist or image interpreter in improving his or her proficiency in diagnosis and use of feature descriptors. Other objects and features will be in part apparent and in part pointed out hereinafter.

Detailed Description Text (2):
While the method of the invention is for training in the interpretation of mammograms using the standardized feature descriptors contained in BI-RADS, the method is applicable to any radiologic imaging modality which is interpreted using a standardized reporting system. The fundamental objective of the method is both to reduce variability in the use of descriptors and to improve diagnostic accuracy in mammographic interpretation.

Detailed Description Text (22):
Image interpretation is performed in a mammography reading room, or an environment that closely simulates one. This can be a dark, quiet room with a mammography viewbox or mammography film multiviewer, or a computer monitor or screen on which the images are displayed. Interpreters can use instruments normally available to them during interpretation of mammograms. Where film is used, these include; for example, a magnifying lens, a bright light for viewing overexposed areas of film, and a ruler. For digital images, a graphic user interface, allows the test subject to navigate through the images. Where the images are available in various degrees of resolution, the subject can move from level of resolution to another as appropriate.

Detailed Description Text (39):
References ACR Bulletin 1999, 55(6): 14-19. Working Group on Novel Breast Ultrasound Technology. Baker, J A, Kornguth, P., Floyd, C E. Breast imaging reporting and data system standardized mammography lexicon: Observer variability in lesion description. AJR 1996; 166:773-778. Bassett L W, Hendrick R E, Bassford T L, et. al. Quality Determinants of Mammography. AHCPR publication No. 95-0632, Rockville Md., 1994. Beam C A, Layde P M, Sullivan D C. Variability in the interpretation of screening mammograms by U.S. radiologists. Archives of Internal Medicine 1996:156:209-213. Berg W A, Campassi C, Sexton M J, et al. Analysis of sources of variation in mammographic interpretation. Radiology 1997, 205(P): 447. Bird, R E, Wallace T W, Yankaskas B C. Analysis of cancers missed at screening mammography. Radiology 1992, 184:613-617. D'Orsi, C J, Kopans, D B. Mammographic Feature Analysis. Seminars in Roentgenology 1993, 28(3): 204-230. D'Orsi C J, Bassett L W, Feig S A, Jackson, V P, Kopans, D B, Linver, M N, Sickles E A, Stelling, C B. The American College of Radiology Breast Imaging Reporting and Data

System (BI-RADS.TM.). Third Edition. Reston [Va.]: American College of Radiology; 1998. D'Orsi C J, Bassett L W, Feig S A, Jackson, V P, Kopans, D B, Linver, M N, Sickles E A, Stelling, C B. Illustrated Breast Imaging Reporting and Data System Second Edition. Reston [Va.]: American College of Radiology; 1995. Elmore J G, Wells C K, Lee C H, Howard D H, Feinstein A R. Variability in radiologists' interpretations of mammograms. NEJM 1995; 331:1493-1499. Elmore J G, Barton M B, Moceri V M, Polk S, Arena P J, Fletcher S W. Ten-year risk of false positive screening mammograms and clinical breast examinations. NEJM 1998, 338(16):1089-96. Federal Register 1991, 62: 55988 Hawkins H. et al. Breast Ultrasound Lexicon Illustrated. Radiology, 1998; 209(P):523. Kopans D B, D'Orsi C J, Adler D D, Bassett L W, Brenner R J, Dodd G D, Feig S A, Lopiano M A, McLelland R, Moskowitz M, Sickles E A. The American College of Radiology Breast Imaging Reporting and Data System. American College of Radiology, Reston, Va.: 1993. Liberman, L, Abramson, A F, Squires, F B, Glassman, J R, Morris, E A, Dershaw, D D. The Breast Imaging Reporting and Data System: Positive predictive Value of mammographic features and final assessment categories. AJR 1998; 171:35-40. Linver M N, Paster S B, Rosenberg R D, Key C R, Stidley C A, King W V. Improvement in mammography interpretation skills in a community radiology practice after dedicated teaching courses: 2-year medical audit of 38,633 cases. Radiology 1992;184:39-43. Metz C E. ROC methodology in radiologic imaging. Investigative Radiology 1986; 21: 720-733. Orel S G, Sullivan D C, Dambro, T J. BI-RADS categorization as a predictor of malignancy. Radiology 1997, 205(P):447 Sickles E A, Ominsky S H, Sollitto R A, Galvin H B, Monticciolo D L. Medical audit of a rapid-throughput mammography screening practice: methodology and results of 27,114 examinations. Radiology 1990; 175:323-327. Shile, P E, Hawkins, H H, O'Neill, M A, Pilgram, T K. Observer Variability in use of Terminology of the American College of Radiology (ACR) Breast Imaging and Reporting Data System (BI-RADS). Academic Radiology 1997; 4(12): 850. Spring, D B, Kimbrell-Wilmot K. Evaluating the success of mammography at the local level: how to conduct an audit of your practice. Radiologic Clinics of North America 1987, 25(5); 983-92.

Other Reference Publication (4):
Breast Cancer Screening/Prevention. Imaginis. Retrieved from the Internet [Mar. 20, 2002]URL:<http://www.pinnacleimaging.com.bresthealth/mqsa. asp?mode=1>.*

Other Reference Publication (6):
"The BI-RADS Lexicon" Retrieved from the Internet [Mar. 20, 2002].
URL:<http://www.eesoftware.net/advscripts/BI-RADS.htm>.*

CLAIMS:

1. A method for training radiologists and other interpreters of radiologic studies by tracking their use of feature descriptors and their diagnostic accuracy in the interpretation of radiologic examinations, as well as the health outcome of patients on whom the interpreted examinations are obtained, the method comprising: tracking each radiologist's characterization of findings in radiologic examinations they interpret using accepted feature descriptors; tracking each radiologist's assessments and conclusions concerning the presence or absence of biological processes that cause the findings they characterize in radiologic examinations; tracking evidence for the presence or absence of biologic processes in patients on whom the interpreted examinations have been obtained; and, having each radiologist review tracked data and associated radiologic exams for the purpose of teaching the radiologist to better understand the relationship between feature descriptors and the biologic processes imaged in radiologic examinations, thereby improving the radiologist's diagnostic accuracy and reducing the variability in their use of standardized terminology.

2. The method of claim 1 further including having the radiologist periodically review tracked data and images to determine whether the radiologist's diagnostic accuracy improves and the radiologst's variability in the use of standardized

terminology decreases.

26. A method for training radiologists and other interpreters of radiologic studies to track and to determine their diagnostic accuracy and use of feature descriptors in the interpretation of radiologic examinations comprising: preparing a test set of images derived from radiologic examinations of patients; having the radiologist evaluate defined areas within the images to characterize an abnormality using accepted feature descriptors; and, reviewing the results of the evaluations to determine the radiologist's ability to recognize abnormalities in the images and to properly characterize any abnormalities found using the feature descriptors thereby to improve the radiologist's accuracy of interpretation, reduce the variability in the use of standardized terminology, and train radiologists in understanding the relationship between feature descriptors and pathological entities found in radiologic examinations.

27. A method for training radiologists and other interpreters of radiologic studies that tracks their use of feature descriptors and determines their diagnostic accuracy during interpretation of radiologic examinations and relates these performance data back to the findings in individual radiologic exams, comprising: preparing a test set of images derived from radiologic examinations of patients; having the radiologist evaluate defined abnormalites within the images to characterize the abnormalities using accepted feature descriptors and to assess the causes of the abnormalities; and, reviewing their evaluations of the radiologic examinations to determine their ability to accurately assess the causes of abnormalities and to consistently characterize abnormalities using the feature descriptors, thereby training radiologists to understand the relationship between feature descriptors and pathological entities found in radiologic examinations, improving the radiologist's accuracy of interpretation, and reducing variability in the use of standardized terminology.

Previous Doc Next Doc Go to Doc#